



BGMP Equipment Upgrade Test Hunters Point Naval Shipyard San Francisco, California

October 2, 2014 BCT Meeting
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Presentation Objective



- To introduce the BCT to some potential new methods for data collection for the Basewide Groundwater Monitoring Program (BGMP)
 - Transducers – groundwater levels
 - Hydrasleeve – groundwater sample collection
- Provide data from a test of these new methods, which was conducted during August 2014
- Discuss the test data results and the potential benefits of scaling up the test methods for general use in the BGMP

Introduction



- Introduction of Equipment Upgrade Test Components
 - Transducers
 - Hydralseeves
- Transducers
 - Transducer Test Locations
 - Water Level Results
 - Temperature Results
- Hydrasleeves
 - Hydrasleeve Implementation
 - Hydrasleeve Test Locations
 - Hydrasleeve Comparative Results (Preliminary Unvalidated)
- Comparative Summary and Conclusions
- Potential Benefits

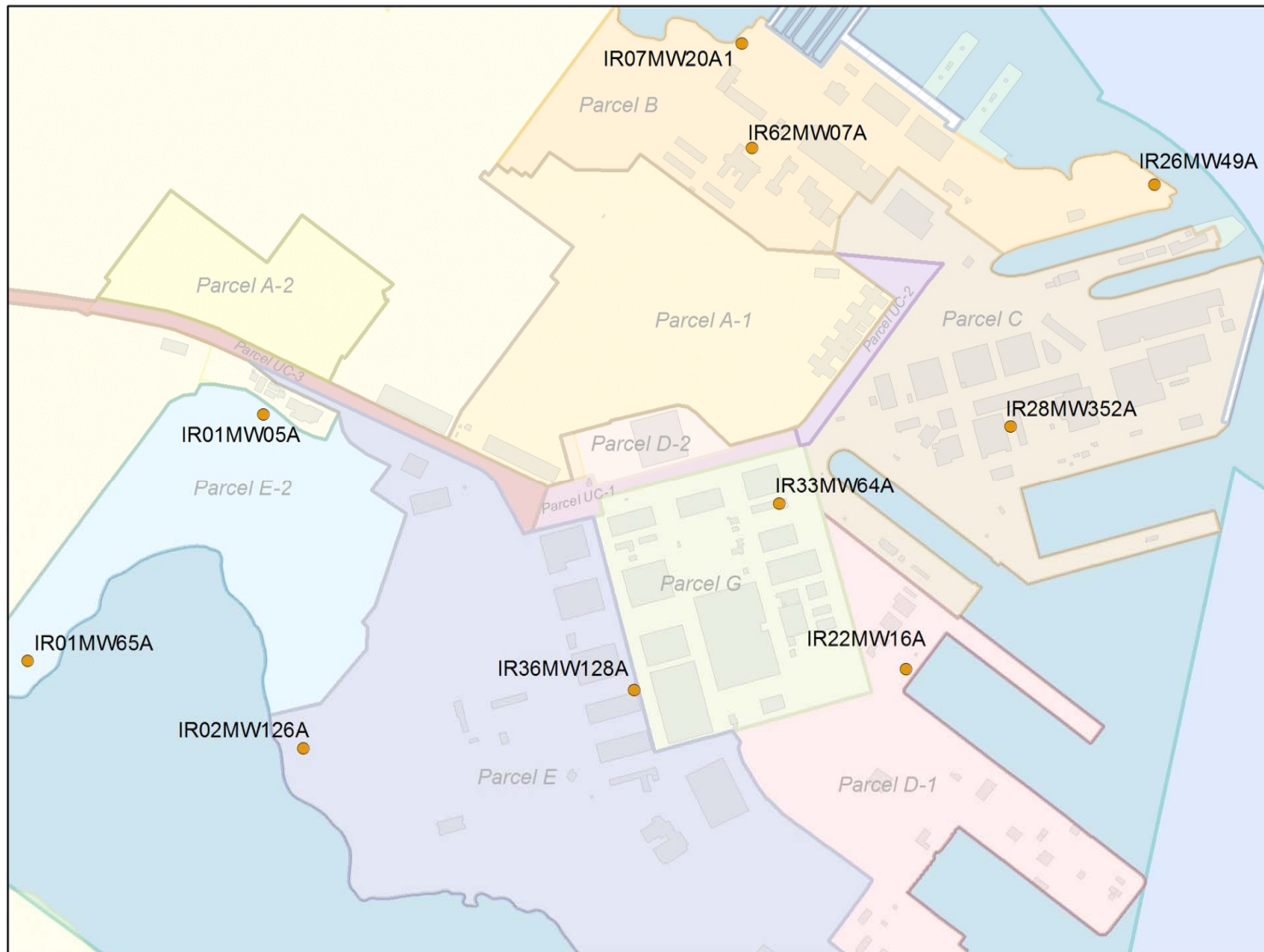
Equipment Upgrade Test Components



During the August 2014 sampling event, we tested two new methods for gathering groundwater data:

- Water Levels: Transducers with data loggers
 - Transducers/loggers as an alternative to manual water level meter measurements
 - Tested 10 locations representing the variety of groundwater level/flow conditions at HPS (inland/upland) with at least one test location per major parcel.
- Groundwater Samples: Hydrasleeves as a sample collection method
 - Hydrasleeves as an alternative to collecting water samples via low-flow purging
 - Tested 10 locations representing the variety of analytes at HPS (metals/organics) with at least one test location per major parcel
 - Some overlap (4 wells), but not necessarily the same locations with the test transducers.

Transducer Test Locations



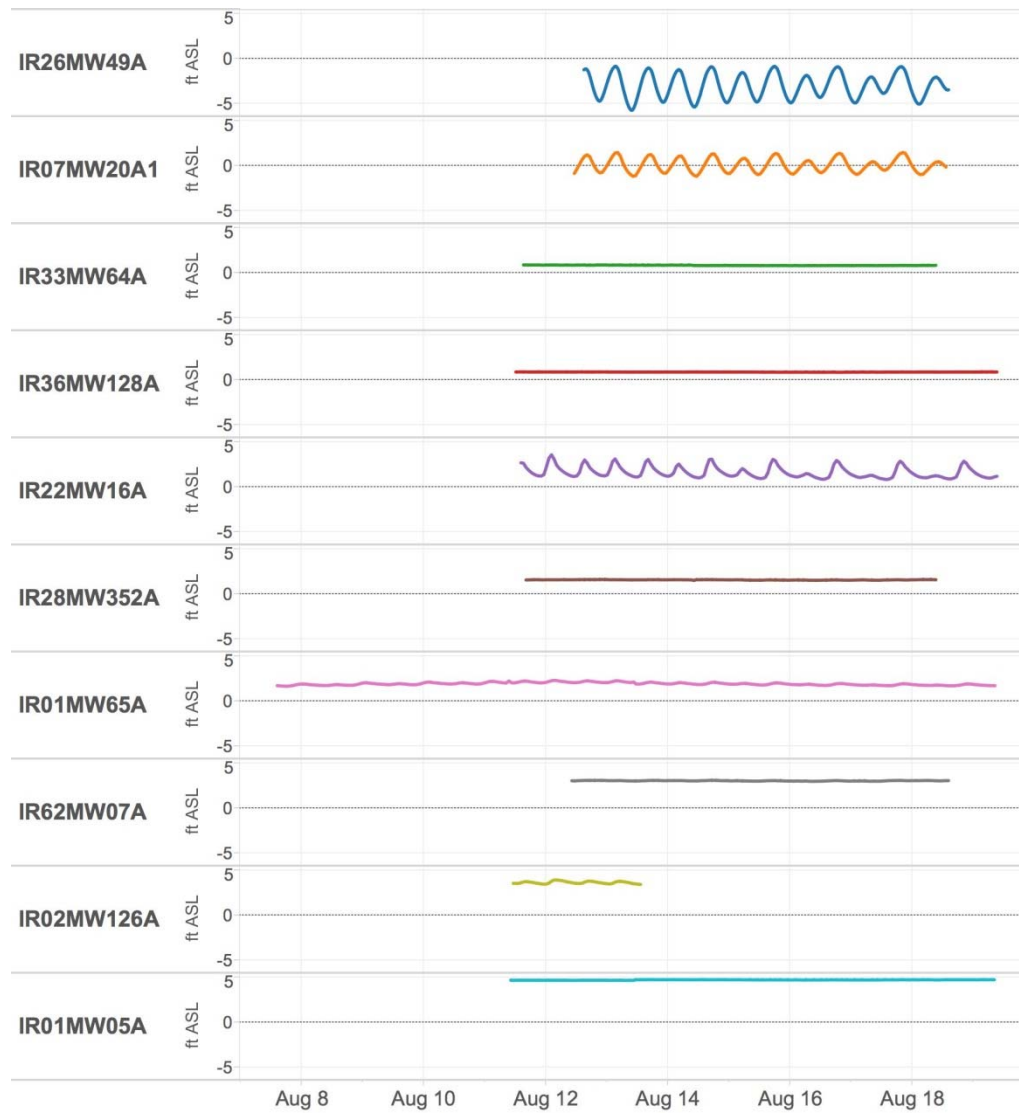
Transducers Used for this Test



1. Rugged Troll 100[®] from In-Situ, Inc.
 - Measures changes in pressure and temperature
2. Requires barometric correction (via a separate barometric troll)



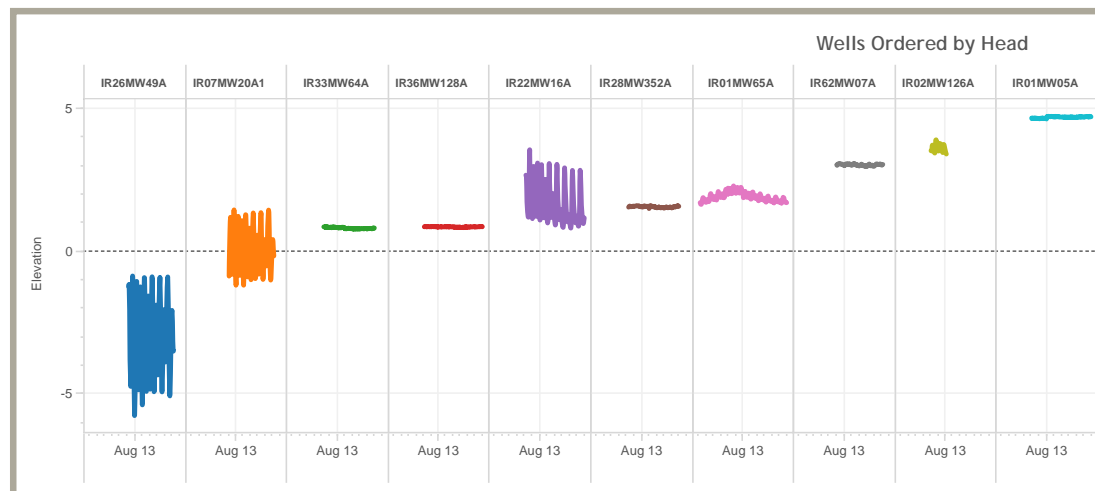
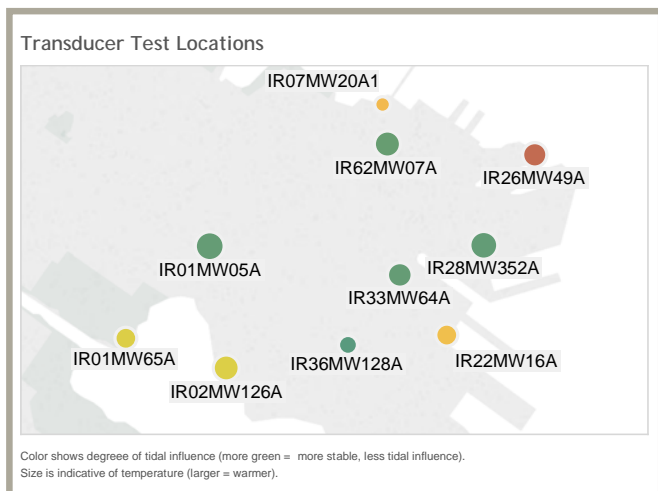
Transducer Results – Water Levels



Location/Color Key



Transducer Results – Water Levels and Temperature



- Map figure shows a combination of temperature results and tidal influence.
 - Size of the circle denotes relative temperature (range ~ 16° – 19° C)
 - Smaller = colder; Larger = warmer
 - Color denotes tidal influence (i.e., water level variability)
 - Green = stable; red = tidally influenced
 - For example, well IR07MW20A1 is a relatively cold, tidally influenced well
- Graphic in upper right shows transducer data, with wells ordered by head (color related to key on previous page)

Hydrasleeve Groundwater Sampling Method

- Hydrasleeves are a passive, grab-sample method of sampling
- Reviewed and used by ITRC, Navy, Air Force, USGS, Department of Energy and other agencies.
- Included as a recommended sampling method in DTSC documents as far back as 2008.
 - *Representative Sampling of Groundwater for Hazardous Substances, Guidance Manual for Groundwater Investigations, DTSC, revised 2008*
- No purging, therefore no wastewater (waste minimization/green)
- Come in a variety of sizes up to 10 liters (can also get custom sizes)

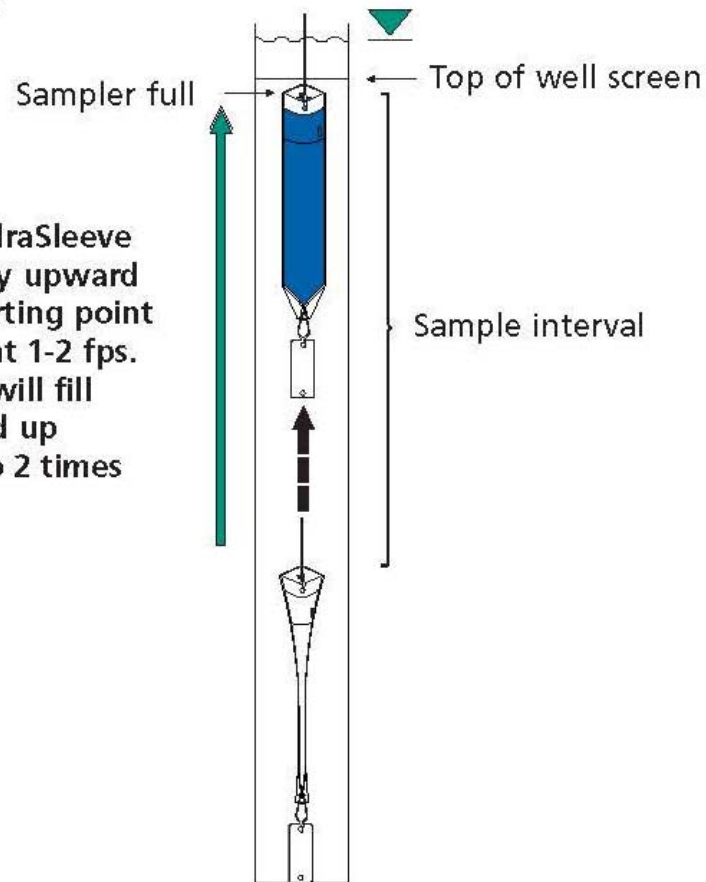


Hydrasleeve Implementation (Field Manual Figure)

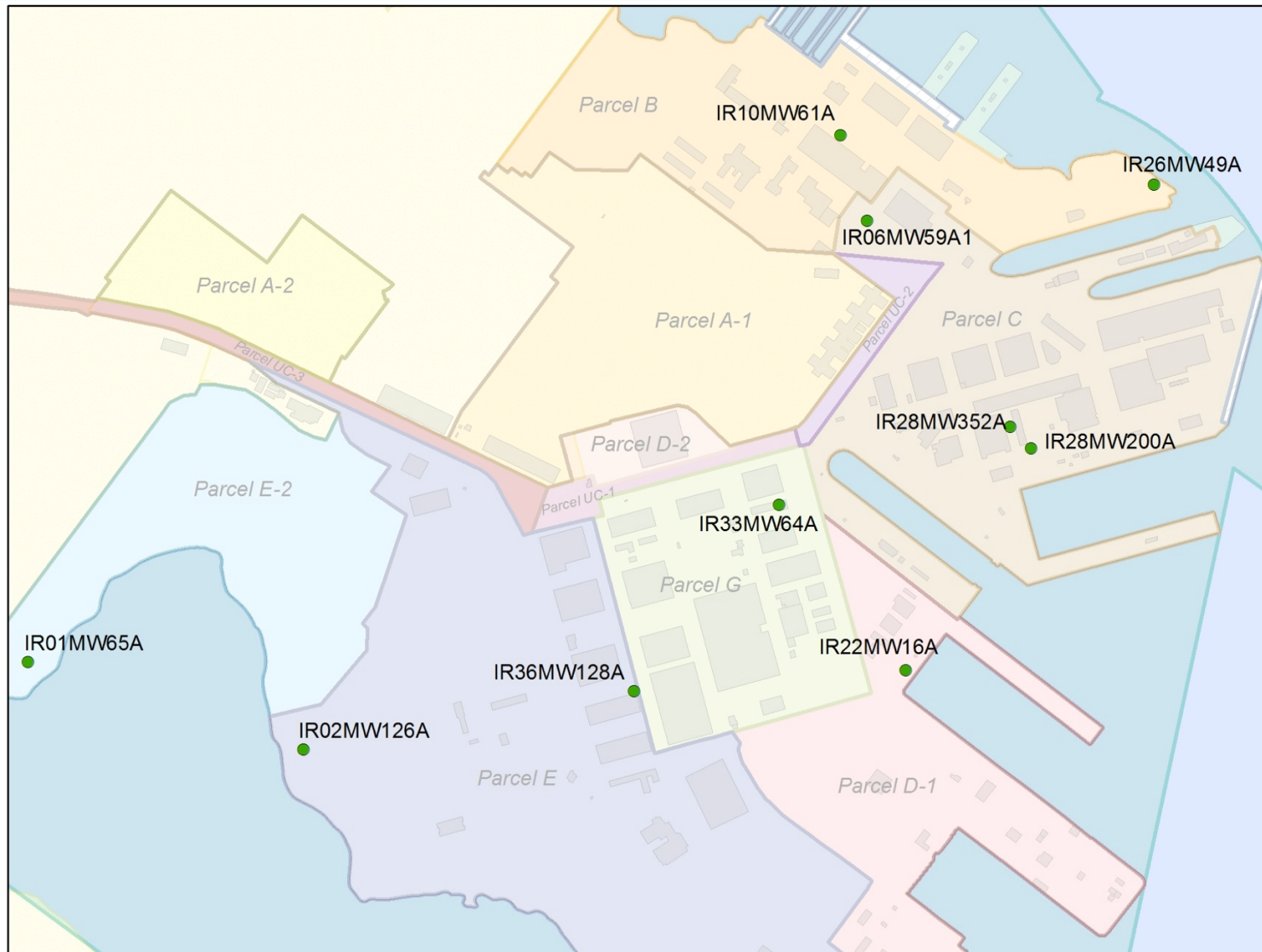


Figure 6

Pull the HydraSleeve continuously upward from its starting point at a constant 1-2 fps. The sleeve will fill when pulled up approx. 1 to 2 times its length.



Hydrasleeve Sample Locations



Comparison of Hydrasleeve/Purge Results (Unvalidated Data)



- 217 analytical results from 10 wells (i.e., 217 sets of pairwise comparisons)
 - All data collected during the same event – August 2014
 - Hydrasleeve sample was collected, followed by low flow purge sample
- No statistically significant difference between the two sampling method data sets (based on a pairwise statistical comparison, 95% confidence interval)
- However, 7 results stand out as appearing different from one another, but in those instances, results from both the hydrasleeve and low flow purge samples were within the historic range of analytical results for the sampled well (i.e., they were directly comparable to historic values). In some cases, the hydrasleeve result is more in line with historic values.
 - 5 were metals results (Zn in IR01MW65A, Cu and Zn in IR02MW126A, Fe in IR10MW61A, HexChrome in IR26MW49A)
 - 1 was organic carbon (IR10MW61A)
 - 1 was ethane (IR10MW61A)
- Please see handout for full details

Comparative Summary and Conclusions



- Transducer versus manual water level meter measurements
 - Data match exactly – since a well visit is needed to download the transducer data, we can gather a calibration data point with a water level meter to ensure that data are matching.
 - Transducer data has a higher sampling frequency, allowing us to evaluate tidal influences better than we have in the past
- Hydrasleeve versus low flow purge sampling
 - Some apparent differences, especially for metals, but both data sets are statistically comparable to one another and to historic values for the sampled wells.

Potential Benefits



- Consider using hydrasleeves and transducers as the primary means of data collection for the Hunters Point BGMP.
 - Transducers
 - Greater data density
 - Better able to understand tidal influence
 - Helpful for focused studies such as Hg mass flux
 - Less labor required for quarterly water level events
 - Hydrasleeves
 - Data statistically comparable
 - Can sample discrete intervals, when necessary
 - Greener sampling method
 - Significant reduction in time at each well head and reduced pump maintenance
 - Disadvantage - may not generate enough water for some Parcel E-2 wells requiring landfill testing. Some wells will require micropurge.

Questions?

